

Drinking Water Source Protection through Effective Use of the TMDL Process

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Presentation Overview

- Background
- Project Goals & Objectives
- Preliminary Findings & Products
 - State Efforts
 - Case Studies
 - Information & Tools
- Next Steps

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BACKGROUND

Quality of Sources of Drinking Water

- Human health implications
 - More and more surface waters used for drinking water
 - Surface waters highly susceptible to contamination from variety of pollutants
- Economic implications
 - Public waters systems treat contaminated water
 - Level of contamination impacts treatment costs, which are often passed on to public

TMDLs and Source Water

- Through SDWA, drinking water programs have mechanisms to protect source waters
- Other opportunities for greater or coordinated protection exist
- TMDLs may be useful tool to help further efforts to protect of sources of drinking water
- SDWA and CWA typically implemented independently of one another

2003 AwwaRF Workshop

- Brought together: Federal and state regulators, drinking water utilities, and stakeholders
- Discussed ways to better integrate CWA and SDWA programs
- Recommended areas for further research:
 - Drinking water utility participation in the TMDL process

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PROJECT GOALS & OBJECTIVES

Project Goal

Provide water utilities with information
and tools that enable them to better
utilize the TMDL process to protect and
improve source water quality

Project Objectives

1. Investigate and report on past strategies used by drinking water utilities to protect source waters using the TMDL process
2. Evaluate and describe measures used to include drinking water objectives in TMDLs

Approach

- Literature review
 - TMDLs developed for source waters
 - TMDLs for pollutants of concern to water utilities
- Summary of state efforts
 - Surveys
- Interview water utilities
 - Develop case studies
- Tools for water utilities

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SUMMARY OF STATE EFFORTS – DESIGNATED USES AND WATER QUALITY CRITERIA

WQS as Tools to Protect Drinking Water Sources

- Do states define designated uses for public water supplies?
 - How are these DUs defined?
- What criteria apply to public water supply DUs?
 - Do these criteria address the range of parameters regulated by MCLs?
- To what extent do criteria that protect aquatic life and human health (i.e., fish consumption/recreation) address the range of parameters regulated by MCLs?
- What narrative standards might protect drinking water sources?
- What DUs and criteria apply to waters actually used as drinking water sources?

Status

- Reviewed WQS for all states, two territories, and select inter-state consortia
- Extracted DUs
- Analyzed how states define their PWS DU(s)
- Identified numeric criteria for PWS for select parameters
- Determined, for each state, what “fishable/swimmable” criteria also apply to PWSs
- Identified narrative criteria and general use provisions that might protect drinking water sources

Data Compiled: Numeric Water Quality Criteria

- Compiled water quality criteria established for:
 - Protecting potable water supplies (PWS)
 - Other “higher” uses (e.g., aquatic life, shellfish, recreation)
 - Ignored “lower” uses (e.g., industrial uses, navigation)
- Compiled criteria for contaminants regulated by MCLs
 - Exception: Contaminants that are not source water issues
- For aquatic life, compiled criteria addressing chronic effects only (ignored criteria addressing acute effects)

Contaminant	Category	Units	Human Health, Water Supply / Domestic Water Supply	Aquatic Life Chronic	Human Health, Water + Fish	Human Health, Fish Ingestion
Antimony	IOC	ppb	6		5.6	640
Arsenic	IOC	ppb	NC	150	0.02	7.6
Asbestos	IOC	MFL	7			
Barium	IOC	ppb	NC			
Beryllium	IOC	ppb	4			
Cadmium	IOC	ppb	5	NC		
Chromium (total)	IOC	ppb	50	11	100	
Copper	IOC	ppb	1,000	NC	1,300	
Cyanide (as free cyanide)	IOC	ppb	200	5		
Fluoride	IOC	ppb	2,000			
Lead	IOC	ppb	50	NC		

Findings: PWS DUs

- All states (except DC) have a Public Water Supply DU (or equivalent)
- States' definitions have different levels of specificity and different "drinkability" goals
 - Many states define acceptable quality presuming application of treatment equivalent to coagulation, filtration, and disinfection
 - A few states add that additional treatment may be necessary to remove naturally occurring impurities
 - Some states have multiple PWS DUs depending on the level of treatment required

Findings: Numeric WQ Criteria for PWS DUs

- Some states set PWS water quality criteria equivalent to MCLs
- Some states adopt numeric criteria published by EPA
 - These criteria do not address all contaminants covered by MCLs
- Some states use hybrid approach and supplement human health criteria with criteria equivalent to MCLs

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SUMMARY OF STATE EFFORTS – SURVEYS

Survey of States/EPA

- Surveys administered to:
 - State Drinking Water Administrators
 - TMDL Program Managers/Coordinators
 - EPA Regions
- Solicit input on
 - Integration of CWA and SDWA efforts
 - Input on ways to further improve upon CWA/SDWA integration

Survey Response Rates

- Surveys returned
 - State drinking water programs: 28
 - State TMDL programs: 21
 - EPA Regions: 3
- Combined, surveys cover 40 states
- Summary of results will not make specific references to individual states or Regions (confidentiality)

Preliminary Findings

- 27 of 40 states: TMDL/DW programs within same agency
 - 15 of these states report that TMDL/DW programs well integrated
- None of the 3 EPA Regions consider the two programs well integrated
 - However, steps being taken to improve integration efforts

Preliminary Findings

- 30 of 40 states report having worked between programs (sometimes) to develop WQS regulated under CWA
 - Examples: Bacteria, toxics, metals
 - Some state have adopted MCLs into their WQS
- States reporting poor integration identified "lack of communication" as biggest impediment
- Some states expressed concern that using drinking water MCLs as WQS for surface waters may result in unattainable restoration goals

Preliminary Findings

- 29 of 40 states reported both programs (sometimes) working together to identify waterbodies used as drinking water supplies that do not meet WQS
 - In 4 of these states, where surveys completed by both DW and TMDL programs, respondents had opposite opinions with one program saying they do work together and the other saying they do not
- 21 of 40 states reported sharing and reviewing draft 303(d) lists
 - Major reason for not sharing / reviewing include: staff limitations, lack of communication and request for input, lack of applicability

Preliminary Findings

- 19 states reported total of 280 waterbodies used as sources of drinking water currently listed on 303(d) lists
 - Sediment, nutrients, fecal coliform, temperature, atrazine, nitrate, mercury, manganese, lead, iron, sulfates, total dissolved solids, pesticides, copper, pH, chlorides, dioxin, PCBs, ammonia, radium, taste and odor

Preliminary Findings

- Many “TMDL” respondents indicated drinking water given high priority for TMDL development
- 10 of 40 states reported working with their counterparts to develop TMDLs for impaired waterbodies used as drinking water sources
- All responding states have lat/long coordinates for all drinking water intakes
 - 14 states have map overlays (in GIS) that identify designated uses and WQS for surface waters in with drinking water intakes

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CASE STUDIES

Participating Utilities

1. Aqua America, PA
2. Columbus Water Works, GA
3. Contra Costa Water District, CA
4. Philadelphia Water Department, PA
5. Santa Clara Valley Water District, CA
6. Wilmington, DE
7. Winthrop Utilities, ME

Focus of Case Studies

- Describe water utilities' involvement in TMDL process
 - How utility became involved
 - Role they played once involved
 - Lessons learned
 - Actions they took (or should have taken) to steer TMDL process to be helpful for drinking water protection

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INFORMATION & TOOLS

Checklists

- Help water utilities identify and gather information to contribute to TMDLs
- Inventory of types of information needed for including drinking water specific interests when setting WQS, designating uses, identifying impairments, and developing TMDLs

Checklists – Examples

Name of your water source_____

Lat/long of your source water intake_____

Have you obtained a copy of your state's current 303(d) list of impaired waters?_____

If so, is your source water listed as impaired?

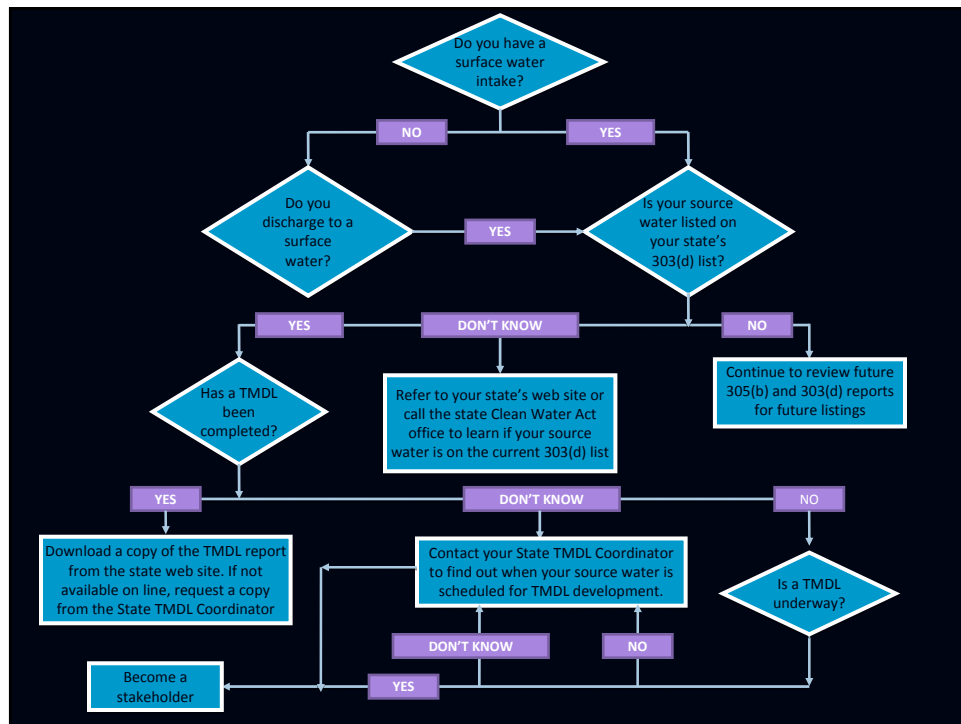
Questions to ask your state TMDL coordinator

Has a TMDL been prepared for your watershed?

If so, how can you get a copy of the TMDL report?

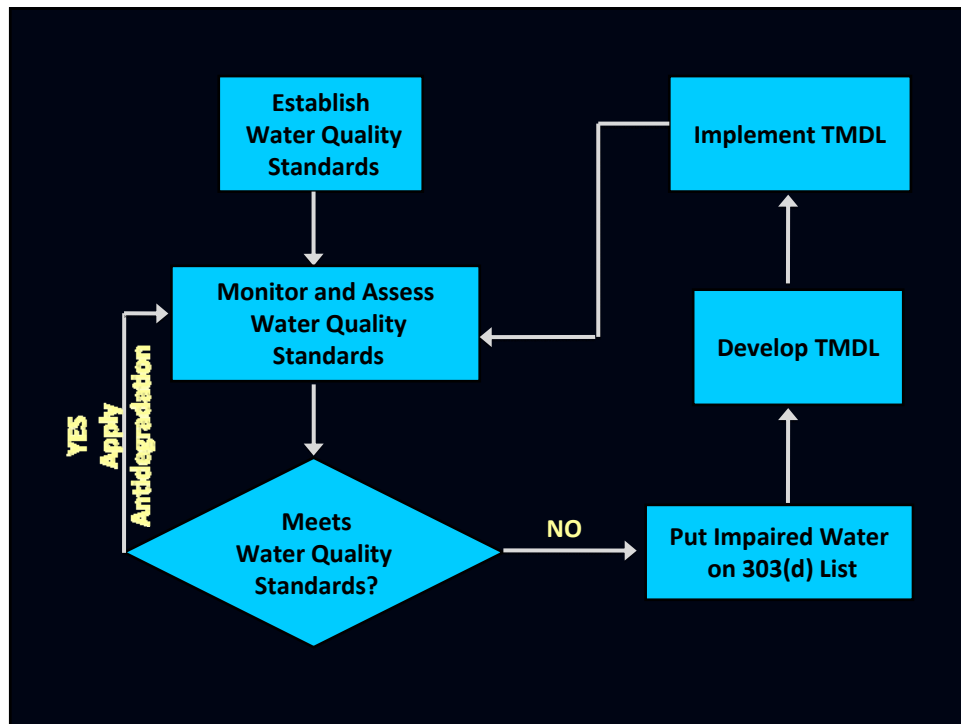
Decision Trees

- Flow charts to help water utilities decide whether they could benefit from getting involved with a TMDL for their watershed
- Example...



Decision Trees

- A decision tree guiding utilities through the TMDL process
 - Brief explanations of the different steps
 - Identifying where in the process utilities can get involved
 - Brief guide to how utilities can get involved with each step
- Example...



Other Tools & Resources

- Key terms and their definitions
- Letter template for utilities to use to write their states asking how to get involved and to ask for more information.
- Key TMDL Web site URLs, including EPA (HQ and Regional) and states,
- List of resources utilities can pursue for assistance with implementing TMDLs

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NEXT STEPS

Next Steps

- Journal article submission to *Opflow*
- Final AwwaRF Report
 - Literature review
 - Discussion of state efforts
 - Drinking water utility case studies
 - Checklists/flowcharts for water utilities
- Webinar for drinking water utilities
 - TMDL regulations and drinking water
 - Example TMDLs for drinking water supplies
 - Case studies (1 -2 utilities)
 - How to get more involved in development of WQS, designated uses, and TMDLs